Listing of Claims:

This listing of claims will replace all prior versions and listings of claims:

1.   (Currently Amended) An apparatus for providing link layer security in a Physical Layer Transceiver (PHY) comprising:

analog circuitry configured to transmit to, and receive data from, a data transmission medium;

digital circuitry ~~coupled to~~ configured for communication with said analog circuitry, said digital circuitry configured to transmit data/control signals to, and receive data/control signals from, a Media Access Controller (MAC);

a PHY communications module ~~coupled to~~ configured for communication with said analog and digital circuitry;

a crypto engine coupled to said digital circuitry, said crypto engine configured to do the following:

encrypt and authenticate transmitted data;

decrypt and authenticate received data;

store data and security information during transmission of data; and

resend stored data without use of said MAC if said PHY detects a collision;

a crypto communications module ~~coupled to~~ configured for communication with said crypto engine, said crypto communications module configured to provide direct connectivity through a MDIO/MDC interface; and

an interface link operatively coupling said PHY communications module to said crypto communications module, wherein the crypto communications module is further configured to provide control signals to said PHY communications module via said interface link.

2.   (Canceled)

3.   (Withdrawn) The apparatus of claim 1, wherein:

said PHY communications module is configured to provide connectivity through a MDIO/MDC interface;

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said crypto communications module is configured to provide connectivity through an interface other than a MDIO/MDC interface.

4.   (Canceled)

5.   (Canceled)

6.   (Canceled)

7.   (Previously Presented) The apparatus of claim 1, wherein said PHY communications module is configured to provide connectivity through a communication medium.

8.   (Previously Presented) The apparatus of claim 7, wherein said communication medium is configured to communicate with a plurality of devices.

9.   (Original) The apparatus of claim 8, wherein said plurality of devices include at least one device that communicates at the PHY level, and at least one device that performs security functions.

10.   (Previously Presented) The apparatus of claim 7, wherein said communication medium communicates with at least one device that performs both PHY and security functions.

11.   (Currently Amended) An apparatus for providing link layer security in a Physical Layer Transceiver (PHY) comprising:

analog circuitry means for providing connectivity to a data transmission medium;

digital circuitry means ~~coupled to~~ configured for communication with said analog circuitry means, said digital circuitry providing connectivity to a Media Access Controller (MAC);

PHY communications means ~~coupled to~~ configured for communication with said analog and digital circuitry means, said PHY communications means configured to provide connectivity through an MDIO/MDC interface;

crypto engine means ~~coupled to~~ configured for communication with said digital circuitry means and comprising both PHY logic and security logic, said crypto engine means configured to do the following:

> > encrypt and authenticate transmitted data;
> >
> > decrypt and authenticate received data;
> >
> > store data and security information during transmission of data; and
> >
> > resend stored data without use of said MAC if said PHY detects a
>
> collision;

crypto communications means ~~coupled to~~ configured for communication with said crypto engine means, said crypto communications means ~~coupled to~~ configured for communication with said MDIO/MDC interface, wherein said MDIO/MDC interface is configured for controlling both the PHY logic and the security logic ~~crypto engine means~~; and

an interface link means operatively coupling said PHY communications means to said crypto communications module.

12.   (Canceled)

13.   (Withdrawn) The apparatus of claim 11, wherein:

PHY communications means being configured for providing connectivity through a MDIO/MDC interface;

said crypto communications means being configured for providing connectivity through an interface other than a MDIO/MDC interface.

14.   (Canceled)

15.   (Canceled)

16.   (Canceled)

17.   (Previously Presented) The apparatus of claim 11, wherein said PHY communications means is configured to provide connectivity through a communication medium means.

18.   (Previously Presented) The apparatus of claim 17, wherein said communication medium means is configured to communicate with a plurality of devices.

19.   (Original) The apparatus of claim 18, wherein said plurality of devices include at least one device that communicates at the PHY level, and at least one device that performs security functions.

20.   (Previously Presented) The apparatus of claim 17, wherein said communication medium communicates with at least one device that performs both PHY and security functions.

21-26. (Canceled)

27.   (New) An apparatus for providing link layer security in a Physical Layer Transceiver (PHY) comprising:

analog circuitry configured to transmit to, and receive data from, a data transmission medium;

digital circuitry configured for communication with said analog circuitry, said digital circuitry configured to transmit data/control signals to, and receive data/control signals from, a Media Access Controller (MAC);

a PHY communications module configured for communication with said analog and digital circuitry;

a crypto engine configured for communication with said digital circuitry, said crypto engine configured to encrypt and authenticate transmitted data, said crypto engine further configured to decrypt and authenticate received data, wherein portions of said crypto engine are implemented by reconfiguring existing hardware components on said PHY;

a crypto communications module configured for communication with said crypto engine, said crypto communications module configured to provide direct connectivity through a MDIO/MDC interface; and

an interface link operatively coupling said PHY communications module to said crypto communications module, wherein the crypto communications module is further configured to provide control signals to said PHY communications module via said interface link.

28.   (New) The apparatus of claim 27, wherein said PHY communications module is configured to provide connectivity through a communication medium.

29.   (New) The apparatus of claim 28, wherein said communication medium is configured to communicate with a plurality of devices.

30.   (New) The apparatus of claim 29, wherein said plurality of devices include at least one device that communicates at the PHY level and at least one device that performs security functions.

31.   (New) The apparatus of claim 28, wherein said communication medium communicates with at least one device that performs both PHY and security functions.